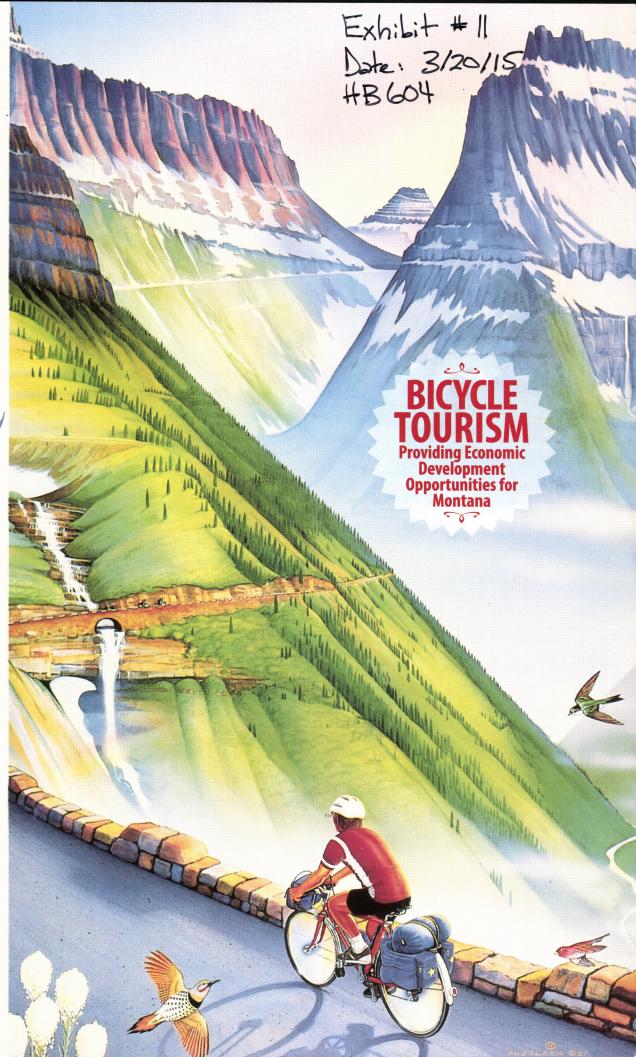
VOLUME 52 NUMBER 2 SUMMER 2014

Inside:

Tourism Study
Tight Oil Revolution
Manufacturing Survey
Early Education Investment





## ABOUT THE BUREAU OF BUSINESS AND ECONOMIC RESEARCH

The Bureau of Business and Economic Research has been providing information about Montana's state and local economies for more than 50 years. Housed on the campus of the University of Montana-Missoula, the Bureau is the research and public service branch of the School of Business Administration. On an ongoing basis, the Bureau analyzes local, state, and national economies; provides annual income, employment, and population forecasts; conducts extensive research on forest products, manufacturing, health care, and Montana Kids Count; designs and conducts comprehensive survey research at its on-site call center; presents annual economic outlook seminars in cities throughout Montana; and publishes the awardwinning Montana Business Quarterly.

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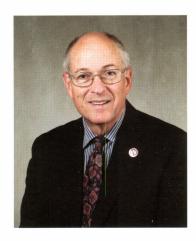


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## MESSAGE FROM PROVOST PERRY BROWN

This summer issue of the Montana Business Quarterly features a real summer activity: bicycle tourism. This is a rapidly growing part of Montana's tourism industry and it, like several other aspects of Montana tourism, differentiates us from many other places. The grandeur of Montana is really captured by cyclists as they move through our beautiful state, and as we have learned, they are with us for an

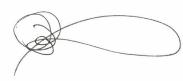


extended time visiting our attractions, eating in our restaurants, staying in our motels and hotels, and shopping in our stores. While highly mobile, they are extended-stay tourists, and we expect their numbers to increase as more people learn about the joy of cycling through Montana. Their travel through our state is slow and deliberate and is the kind of travel that leads to a love affair with the state that John Steinbeck realized several decades ago in his book, "Travels With Charley."

Bicycling tourism is not the only tourism in Montana, and we host more than 10 million people each year as they visit our special state, one of the most iconic regions of North America. The Institute for Tourism and Recreation Research at UM has been studying tourism in Montana since the 1980s, and through their work, we have learned about our guests and how much they cherish their time in Montana. This recent investigation of bicycling tourism continues ITRR's effort to help us understand how we might enhance a huge part of the Montana economy.

Tourism is one of the many areas of our economy studied by the University. Forest products, health care, energy development, manufacturing, environmental remediation, transportation, and many other areas also are the subject of study. We work to keep our citizenry informed about our state and its economy. Please enjoy reading this issue of the *Montana Business Quarterly*.

Sincerely,



Perry Brown Provost and Vice President for Academic Affairs University of Montana

To subscribe, go to www.bber.umt.edu/mbq

# MONTANA BUSINESS QUARTERLY

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Cover image from the painting "Going to the Sun" by Monte Dolack, which was commissioned by Adventure Cycling of Missoula, Montana, is available as an art poster at Dolack.com or adventurecycling.org.

### Printed by the University of Montana Printing Services

The Montana Business Quarterly (ISSN0026-9921) is published four times a year by the Bureau of Business and Economic Research and is a service of the University of Montana-Missoula. The subscription rates for the Quarterly are \$35 per year, \$65 for two years, \$90 for three years, and \$10 per issue. Periodical postage is paid in Missoula, MT 59812. POSTMASTER: Send address changes to the Montana Business Quarterly, Bureau of Business and Economic Research, the University of Montana, Missoula, MT 59812. Contents of the Quarterly reflect the views and opinions of the authors and do not necessarily represent those of the Bureau, the School of Business Administration, or the University. The contents of this publication may be reproduced without the consent of the publisher and/or authors. Proper credit should be given to the Quarterly and its contributors for the use of any published material. The Montana Business Quarterly is available on microfilm from University Microfilms, 300 N. Zeeb Rd., Ann Arbor, MI 49106. Reprints of the articles are not available, but additional copies of the Quarterly can be secured at \$10 per copy. All inquiries regarding subscriptions, publications, etc., should be addressed to: Montana Business Quarterly, Bureau of Business and Economic Research, University of Montana, Missoula, MT 59812, 406-243-5113.



## **Bicycle Tourism**

### **Providing Economic Development Opportunities for Montana**

Norma Polovitz Nickerson, Jake Jorgenson, Meredith Berry, Jane Kwenye, Daniel Kozel, and Jessica Schutz



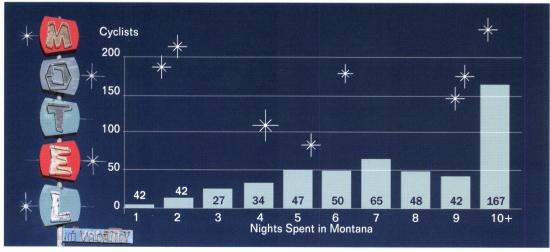
Photo by Aaron Teasdale

Bicycle tourism is gaining momentum in Montana, and not just on the downhill segment. In fact, it could be the new phenomenon in the travel industry. And it's definitely an economic boon: Multiday bicyclists take longer to get anywhere, thereby showering the communities they stop in with outside dollars.

From the 1890s, biking was the means for independent transport until motor vehicles took over in the 1920s. By the mid-1960s, the surge of air travel redefined what it meant to travel. Today, bicycle tourism is starting to receive the attention of researchers, destinations, and entrepreneurs. It is a form of travel that slows the pace down to a level where travelers can view, hear, smell, and feel the countryside in which they are traveling.

A recent study by the Institute for Tourism and Recreation Research (ITRR) at the University of Montana in cooperation with the Adventure Cycling Association found that bicycle tourism offers economic development potential for small businesses in towns throughout the state. Bicycle travelers spend an average of \$75.75 per person per day and stay eight nights or more in the state. In contrast, the average 2013 nonresident Montana vacationer during July, August, and September spent \$69.12 per person per day and stayed 6.17 nights. This equates to an additional \$180 spent per person by cyclists in Montana during the eight-day average stay. However, this is a conservative estimate. Figure 1 shows that the majority of bicyclists spent 10 or more nights in Montana.

Figure 1
Nights Spent in Montana by Touring Bicyclists



Source: Institute for Tourism and Recreation Research, University of Montana.

ITRR always uses the conservative estimates from survey data though. Table 1 displays the average amount spent per category. The "All Cyclists" column averages the spending of all respondents even if they completely skipped writing down any expenditure amount. We replaced all missing data with a zero, which inherently reduces the average. The second column provides the average amount spent by all cyclists who reported spending in at least one category, with

zeroes in remaining categories where spending amounts were not recorded. The results indicate that bicycle tourists in Montana spend between \$75 and \$102 per person per day.

In addition to spending more time and money in the state than the average vacationer, these cyclists spent nights in various towns throughout the state. The map (Figure 2) displays how many of the respondents to the ITRR survey spent nights in each of the listed communities. This was a

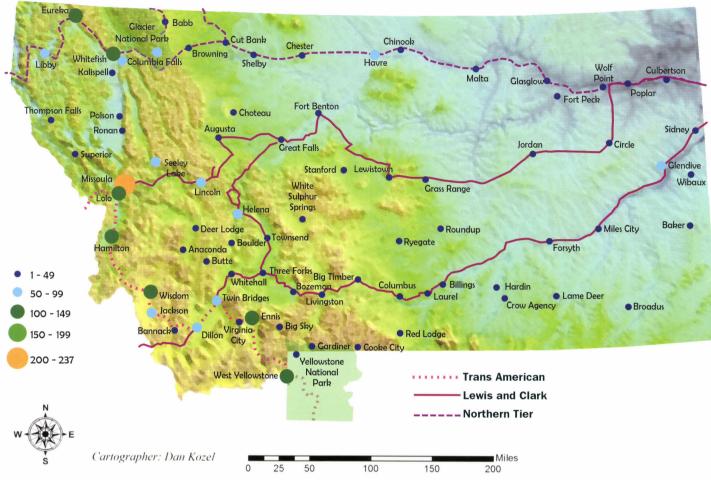
Table 1
Average Daily Expenditures of All Cyclists and Only Those Who Spent Money in Montana

| Spending Categories                                   | All Cyclists (n= 468) | Only Cyclists Who Spent<br>Money in Montana<br>(n=373) |
|---|-----------------------|--|
| Accommodations (hotel/motel, B&B, hostel, etc.)       | \$22.23               | \$28.23  |
| Restaurants and Bars                                  | \$15.66               | \$19.03  |
| Adventure Cycling Association Guided Trip             | \$12.01               | \$17.47  |
| Groceries and Snacks                                  | \$7.53                | \$9.08   |
| Bike-Related Retail Purchases                         | \$3.31                | \$5.52   |
| Camping (Private & Public)                            | \$4.00                | \$5.40   |
| Other Retail Purchases                                | \$3.32                | \$4.71   |
| Transportation Fares (e.g. bus, plane)                | \$2.09                | \$3.73   |
| Fuel/Gasoline   | \$2.02                | \$2.99   |
| Bike Repairs/Service                                  | \$1.35                | \$2.03   |
| Other Guided or Outfitted Trip (e.g. rafting/fishing) | \$0.59                | \$1.70   |
| Services (e.g. rentals, massage, showers, medical)    | \$0.64                | \$1.33   |
| Fees/Licenses/Admittances (e.g. park fees, movies)    | \$0.78                | \$1.14   |
| Other Expenditures                                    | \$0.22                | \$0.55   |
|   | TOTAL = \$75.75       | TOTAL = \$102.92                                       |

Source: Institute for Tourism and Recreation Research, University of Montana.



Figure 2
Overnight Location of Touring Cyclists in Montana



Source: Institute for Tourism and Recreation Research, University of Montana.

sample of 497 cyclists who said they spent nights in Montana over the past three years on a cycling trip. Adventure Cycling Association has three major routes – Trans American route, Lewis and Clark route, and Northern Tier route (Figure 2). Specialized maps for each route guide cyclists through Montana. As shown, these routes are not the only places cyclists spend their nights. It is entirely possible that every community in this state could become an overnight location for cyclists.

One great Montana example is the Twin Bridges bike camp. This unique camping facility meets the needs of cyclists traveling through the Ruby Valley. The camp, situated next to the Beaverhead River, is located one block from town and has showers, an indoor eating area, outdoor sinks, and storage. Twin Bridges built the facility in 2009 and depends on donations to keep it maintained. Donations have ranged from as little as 76 cents with a note saying, "Sorry, that's all I had" to \$100. Cyclists then spend additional money in town at restaurants, stores, the self-service laundry, and, of course, the bars.

The Twin Bridges success story could be emulated throughout Montana by any small town where residents desire to keep travelers in their towns a little longer. As one bicyclist wrote, "The Twin Bridges bike 'hostel' at the city park was FIRST RATE. One of the best of my 59-day ride across the USA. More towns along the TransAm route should build one!" Roger Hutchinson, owner of the Main Street Market in Twin Bridges, said that if a group comes through, they might spend a couple hundred dollars over a day or two. Bicycle tourism can include special catering to this type of visitor: Often, cyclists arrive after closing hours, and he opens the store just for them.

The ITRR study also discovered challenges that come with bicycle tourism. Time and time again, cyclists mentioned that road conditions made their travels in Montana difficult. One cyclist summed it up by saying, "Get rid of those 'rumble strips' on the edge of some roads! They [usually] do not leave enough room to cycle to the right of the rumble strips, thus forcing cyclists to be in the main part of the road. PLEASE,



get rid of the strips. Or, at least allow 2 feet of paved shoulder to the right of the rumble strips. The traffic engineers (I'm guessing most do not ride bikes) think they are making it safe for the car drivers. But, in fact, they have created a very dangerous traffic hazard for bicyclists!"

In 2003, the Montana Department of Transportation conducted a study that determined the reduction in interstate highway off-road crash rates attributable to shoulder rumble strips was 14 percent. This finding increased the installation of rumble strips, much to the dismay of cyclists who are forced into the main roadway and motorists who suddenly come upon a biker in the main lane of travel. A November 2012 MDT memo, however, addresses this concern with statements on how and where to place rumble strips based on consideration of bicycle travel. The question is whether the transportation department will change the current rumble strips to appease cyclists and the motoring public.

Other concerns highlighted in the study related to food

and lodging availability. One cyclist wrote, "Of course I need good food. Not fast food or deep fried food. Wholesome food. Or as much in that direction as possible." This sentiment was echoed by many. Cyclists said that certain stretches of Montana lacked the availability of food, be it grocery stores, local cafes, or restaurants. This is a serious concern

since very little can be carried on cycling trips. One person even suggested placing drinking fountains along some of the desolate highways in eastern Montana. Accommodations can pose a similar problem. One cyclist commented, "I found that the infrastructure to support cycling in eastern Montana, along U.S. route 2, was quite poor. I had expected to camp a few nights, but the campgrounds were rudimentary at best, seldom had showers, and were often right next to the railroad tracks with trains going by all night long." Another said, "I thought it was a long desolate stretch from Lewistown to Glendive. I would have appreciated more motels and/or a state park."

In the study, cyclists were asked to describe their degree of satisfaction on a variety of aspects of Montana. Overall, these are travelers happy with Montana. Cyclists were most satisfied with the hospitality of local people, historical sites along the routes, local breweries, signage on highways, signage in towns, and availability of camping areas. Cyclists were least

satisfied with cell phone coverage, width of shoulders, availability of cycling stores/equipment, availability of bike repair service, and quantity of debris on shoulders/road.

Business opportunities catering to the cycling tourist can be part of any community with a desire to keep visitors in town. One interesting finding



Photo by Aaron Teasdale

in the study is that cyclists love local breweries. It's a great way for them to add carbs to their diets and social interaction to their days. Could local breweries in small towns become the "lost" schoolhouse gathering place of the early years in Montana? The new Lolo Peak Brewing Company in Lolo is hoping that is the case. In a March 9, 2014, *Missoulian* article, brewery owners Patrick Offen and Al Zepeda said, "The biggest thing is Lolo doesn't really have a place where people can go and socialize and meet their brewers and learn about the person they've been living next to for the past 10 years. That's what the brewery is going to be too. We don't want a formal setting. We want a setting where people can come in, chat with each other, [and] meet new people. It's about bringing the community together. This is definitely going to be the spot to do it."

Other entrepreneurial opportunities include the addition of bicycle accessories in hardware stores, markets, or other retail outlets. There is a need for restaurants that have more than French fries and burgers, as well as accommodations that are moderate in price. Cyclists need laundry facilities, wireless Internet availability, and perhaps a massage. The more services they find in a community, the more likely they will stay an extra day.

Why should small towns consider these business opportunities? According to ITRR nonresident studies, an average of 500,000 nonresidents have indicated road touring/

biking in Montana while on vacation each year for the past four years. These numbers are likely to increase as bicycle tourism grabs hold in North America. Montana has the opportunity to rival Oregon for biking experiences. We have the scenery, low traffic highways, and the friendliest people. Our only need is the attention to highway infrastructure and the desire by entrepreneurs to start

or expand a business in rural Montana. According to the folks in Twin Bridges, the grapevine within the cycling community is unbelievable. Once a few riders stopped in and found out what was available for them in town, the word spread like wildfire.

If that has not convinced the reader that bicycle tourism is an exceptional investment, read what cyclists wrote about their most memorable experience in Montana.

"Riding up Logan Pass in the early morning was one of the great experiences of my 30-year life as a cyclist. Breath-taking! We spent the night at the campsite on the other side of the

climb and then rode up into Waterton. We plan to explore more of the state by bike in coming years."

"Met a local fellow in Jackson who invited my son and me to dinner at his cabin along with some of his other friends. From my journal: "Elk steak, fresh green vegetables, corn on the cob, homemade beer, and barley wine! THE BEST MEAL we've had in 5 weeks! The scenery, hospitality, and discussion were wonderful ... not a NY experience for sure!"

"The most memorable day cycling in Montana was climbing up to the town of Wisdom and spending the night in that location. It was not one of the largest climbs of the trip so far, but we were unsure whether the snow had melted from the previous night's storm up top. When we arrived the snow had indeed melted, making it safe for travel with skinny tires. The town of Wisdom and the absolutely breathtaking scenery was the most memorable experience of the three-month cross country trip."

"After a long hot day riding and arriving in Helena, MT, just ahead of a thunderstorm, we stopped for supplies at the local grocery store. While waiting out the rain under the wonderful awning, two different people asked us about our trip and offered us a shower and a place to stay. This was quite welcomed as we were planning the end of the trip for my son as he had to return to work while I would continue on to Minnesota. The family we stayed with helped us get his

bike to UPS and took him to the airport as well as putting us up for two days! We had not only had a great time cycling in Montana but had made some great friends."

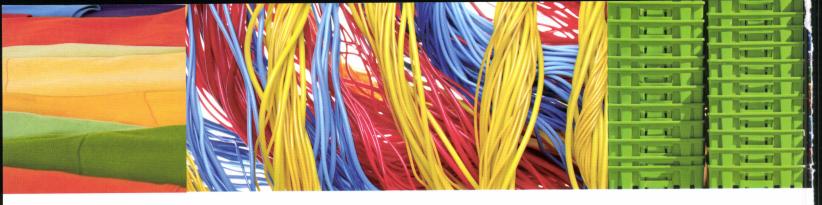
"Can't say just one [memorable experience], but to put the one out, [it was] after Jackson on the road to Dillon. Beauty, infinity of the sky, freedom."



Photo by Chuck Haney

Norma Nickerson is a research professor and director of the Institute for Tourism and Recreation Research in the College of Forestry and Conservation at the University of Montana. Jake Jorgenson, Meredith Berry, and Jane Kwenye are Ph.D. students in the College of Forestry and Conservation. Daniel Kozel is a master's student in the Department of Geography. Jessica Schutz is a master's student in the Department of Society and Conservation. All are at the University of Montana.

The full report on Cycle Tourism in Montana can be found at: http://www.itrr.umt.edu/Research2013/Multi-dayCyclingStudy.pdf



## **Montana Manufacturers Survey**

### **Operating in Montana has Many Advantages**

Steven W. Hayes, Todd A. Morgan, Charles E. Keegan III, Colin B. Sorenson, and Shannon Furniss

iving a "Montana lifestyle" with access to recreational opportunities is one of the advantages of operating a manufacturing business in Montana, according to respondents to BBER's annual manufacturers survey.

So is the affordable cost of living that allows people to pay their mortgages while bootstrapping a business, says Courtney McKee, co-owner of Headframe Spirits, a distillery in Butte (see sidebar, page 9). Not to mention the fact that people from "the governor on down will bend over backward to help you."

For Robert Kincaid, an engineer at ATK Sporting Group in Manhattan, it's the strong Montana work ethic that helps make businesses successful. For James Stephens, co-founder of Blue Marble Biomaterials in Missoula, it's the opportunity to collaborate with universities, businesses, and industries that makes Montana a desirable place to do business (see sidebars, pages 11 and 13).

In the past year, manufacturing has experienced a resurgence throughout the U.S., with manufacturing employment at the highest level since 2008. Manufacturing continues to play a significant role in Montana's economy.

For this year's survey, BBER contacted more than 200 firms, including Montana's largest manufacturing facilities (as measured by the number of people employed), as well as smaller firms representative of their sectors. Of the firms contacted, 76 percent responded to the survey. More than 35 percent of the manufacturers surveyed indicated they have more than 50 employees in Montana. Just over 20 percent indicated their businesses are more than 50 years old, and one-quarter indicated their businesses have been in Montana 20 or fewer years.

### **Advantages and Disadvantages**

Through a pair of open-ended questions, the survey asked participants what they saw as the biggest advantages of operating a manufacturing business in Montana and the most significant barriers to starting or expanding an existing manufacturing business in the state.

The most common responses were related to the high quality, availability, and low cost of labor (33 percent of respondents) and the high quality of life, Montana lifestyle, and recreational opportunities (29 percent). Other frequently cited advantages of operating in Montana were close proximity to raw materials or markets, lower costs in general, lower taxes, and less regulation. Surprisingly, 12 percent of survey respondents indicated there was no advantage to the business being in Montana. One response was: "None; it's poverty with a view."

The most frequently indicated barriers to manufacturing growth or new business formation in Montana were distance to markets and/or associated transportation and shipping costs (18 percent of responses) and lack of skilled or available workforce (26 percent). Regulations and taxes were also very common responses (31 percent), but many respondents did not differentiate between state and federal regulation or specifically mention federal regulations, which would apply in any state. Property tax, equipment tax, and workers' compensation rates were frequently identified as Montanaspecific issues.

### **Important Business Issues**

Survey recipients were given a list of business-related issues and were asked to rate each in terms of its importance to their





"Drilling holes into hard earth. Packing dynamite into walls that hold untold tons of rock above you. It takes finesse not to bring the mountain down on you."

In the late 1800s Butte was the richest hill on earth, and immigrants came from Ireland, Italy, Czechoslovakia, and China to find their fortune mining gold, silver, and copper. Mining was hard work, and after a long day's work, miners would often share a drink together.

Butte has lots of stories, and John and Courtney McKee like to tell a few of them on their website, www.headframespirits. com. With the city's rich culture and history in mind, the McKees opened Headframe Spirits so friends could gather together to drink some spirits and tell old stories about Butte ... and create a few new ones.

In 2010, the McKees founded Headframe Spirits, a name they came up with from the structural frames – or headframes – that are still scattered throughout Butte above mine shafts. Located in one of the city's historic buildings, Headframe Spirits produces bourbon, whiskey, vodka, and gin and manufactures distillation equipment for other distilleries.

### **Butte Distillery Grows More Rapidly than Anticipated**

The McKees decided to start a business in Butte after John lost his job in the biodiesel industry. Getting financing was a struggle, and they started with a conservative business plan, hoping that John would get a paycheck after about 12 months of operation. Courtney planned on helping out part-time at the distillery and continuing on with her consulting business to help support the family. On opening night, the distillery

was so busy that the
McKees had to recruit their
friends to get behind the
bar and mix up cocktails.

"We had no idea how successful it would be," Courtney said. "Within three months, we had five people on the payroll."

Headframe Spirits now has 25 people on the payroll, and the McKees have been named Montana Entrepreneurs of the Year for 2013.

Butte was a great place to live while bootstrapping the business, Courtney said. It was affordable, and they could still manage to pay their mortgage while building their business. In addition, they were able to build a network of people to advise them. In Connecticut where Courtney grew up, it was nearly impossible to get into the mayor's office or the governor's office, she said. "In Montana, everyone from the governor on down will bend over backward to help you," she said. "There's an attitude of 'let's be successful together and make Montana the entrepreneurial destination it is."

Like microbreweries, distilleries are becoming more popular nationwide, and Montana now has between 15 and 17 in the state, Courtney said. Headframe's spirits are popular with the locals and tourists and are named after some of Butte's historic mines: Orphan Girl Bourbon Cream Liqueur, Neversweat Bourbon Whiskey, High Ore Vodka, Anselmo Gin, and Destroying Angel Whiskey.



The McKees have recently announced that they will expand and eventually hire about 50 employees. They plan to use Butte's Kelley Mine Yard and buildings for a production distillery, a restaurant, and an outdoor event space.

Expanding production into the Kelley Mine would make Headframe Spirts the largest distillery west of the Mississippi, Courtney said.

businesses. There was no specified time frame, indicating the general and enduring nature of these issues.

Health insurance cost was the No.1 issue, and 80 percent of respondents rated it very important, similar to last year. Workers' compensation rates were very important to 63 percent of responding firms, with workers' compensation rules rated as very important to 51 percent. Energy costs were somewhat less important to respondents, with 50 percent rating them as very important – the same as last year. Raw material availability was rated very important by 53 percent of respondent firms. The proportion indicating a shortage of qualified workers as very important in 2013 was 57 percent, a slight increase from 2012 and 2011 at 51 percent, an increase from 41 percent in 2010, 35 percent in 2009, 45 percent in 2008, and 50 percent in 2007, but down from 69 percent in 2006 when the economy was much stronger. Foreign competition was ranked the least important of the issues, with 47 percent of respondents rating it as very unimportant and just 17 percent rating it as very important.

When asked about plans for growth and how growth is financed, only 7 percent of respondents indicated they are not planning for growth or business expansion. Almost 70 percent of respondents indicated they use retained earnings or profits to finance growth, and more than half indicated using bank loans. Less than 10 percent of firms indicated using funds from family, friends, partners, or "angel" investors. About 5 percent indicated using funds from other investors, shareholders, or parent companies.

Table 1
Employment in Montana Manufacturing Sectors, 2010 and 2013

| Manufacturing Sector                | 2010   | 2013*  | Percent<br>Change |
|-------------------------------------|--------|--------|-------------------|
| Wood, paper & furniture             | 4,216  | 4,158  | -1%               |
| Food & beverage                     | 3,545  | 3,900  | 10%               |
| Primary & fabricated metals         | 2,063  | 3,180  | 54%               |
| Chemicals, petroleum & coal         | 2,085  | 1,880  | -10%              |
| Machinery                           | 1,168  | 1,400  | 20%               |
| Nonmetallic minerals                | 938    | 1,700  | 81%               |
| Textiles, clothing & leather goods  | 784    | 831    | 6%                |
| Computers, electronics & appliances | 641    | 749    | 17%               |
| All other manufacturing             | 4,362  | 4,350  | 0%                |
| Total                               | 19,802 | 22,148 | 12%               |

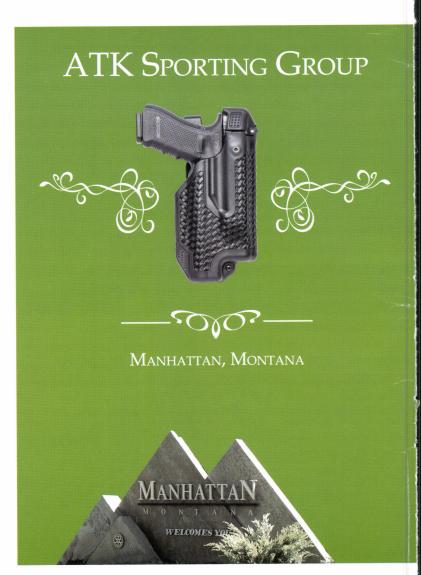
<sup>\*</sup>Estimate.

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

### The Year 2013 in Review

Manufacturing in Montana has experienced three years in a row of improvements, with 2011, 2012, and 2013 each outpacing the prior year in employment, worker earnings, and outputs. Total manufacturing employment in Montana was 19,802 in 2010 and was estimated to have increased about 12 percent to more than 22,100 workers for 2013 (Table 1). Earnings of manufacturing employees exceeded \$1 billion during 2012, with five Montana counties – Yellowstone, Flathead, Gallatin, Missoula, and Cascade – showing more than \$50 million in manufacturing employee earnings. Manufacturing worker earnings were estimated to have grown about 6 percent, topping \$1.1 billion for 2013. Annual sales from Montana manufacturers in 2013 were estimated at \$14 billion, about 7 percent higher than 2012.

Manufacturing jobs in Montana produced, on average, about \$49,300 in earnings per employee during 2012 (most recent data available), compared to the average for all sectors – \$40,800 per employee (Table 2). Several sectors such as



nonmetallic mineral products manufacturing, machinery manufacturing, motor vehicle and transportation equipment manufacturing, and chemical manufacturing had annual average worker earnings in excess of \$50,000 per employee, and petroleum and coal products manufacturing had worker earnings that exceed \$100,000 per employee during 2012.

In addition to relatively high wages, manufacturing produced significant added value to Montana's economy. As a measure of economic output, gross state product (GSP) represents the value added to goods and services produced in the state. Although manufacturing accounted for roughly 3 percent of total employment and 4 percent of worker earnings in Montana during 2012 (most recent data available), it accounted for more than 6 percent of GSP. The GSP per employee (\$99,300) in manufacturing was nearly double the average GSP per employee (\$52,870) for all sectors in Montana during 2012, indicating manufacturing jobs added substantially more value to the economy compared to several other sectors (Table 2). The growth of real GSP

Table 2
Earnings and Gross State Product (GSP) per Employee in Select
Sectors of Montana Economy

| 2012 Earn-<br>ings per<br>Employee<br>(thousand \$) | 2012 GSP<br>per<br>Employee<br>(thousand \$)  | Real GSP per<br>Employee<br>Growth<br>2001-2012   |
|---|---|---|
| 40.8  | 52.9  | 11%   |
| 49.3  | 99.3  | 51%   |
| 44.9  | 69.2  | 47%   |
| 56.4  | 152.1   | 55%   |
| 97.8  | 96.6  | -54%  |
| 45.8  | 41.7  | -13%  |
| 28.3  | 35.0  | 22%   |
| 48.0  | 51.6  | 26%   |
| 48.2  | 44.2  | 9%  |
| 20.0  | 24.0  | 14%   |
| 56.4  | 53.8  | 3%  |
|   | ings per<br>Employee<br>(thousand \$)<br>40.8<br>49.3<br>44.9<br>56.4<br>97.8<br>45.8<br>28.3<br>48.0 | ings per Employee (thousand \$)         per Employee (thousand \$)           40.8         52.9           49.3         99.3           44.9         69.2           56.4         152.1           97.8         96.6           45.8         41.7           28.3         35.0           48.0         51.6           48.2         44.2           20.0         24.0 |

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

### Fortune 500 Company Locates in Manhattan, Montana

Just 15 miles west of Bozeman in the small town of Manhattan, a Fortune 500 company has located its 80,000-square-foot factory, which employs 210 people who manufacture products for hunters, shooting enthusiasts, the military, and law enforcement agencies.

Two summers ago, ATK Sporting Group, a subsidiary of aerospace, defense, and sporting contractor Alliant Techsystems, Inc. (ATK), opened for business in its new location. ATK was previously located in a 17,000-square-foot building in Bozeman and moved so it could expand its operation. But this manufacturing success story began 11 years ago at Delta Design Group, which was located in a small shop in Belgrade.

Robert Kincaid, an engineer and co-founder of Delta Design Group, started research and development with four others on the Serpa holster, a gun holster that eventually became very popular with the military and law enforcement. The holster was a big success, Kincaid says, and the Virginia-based Blackhawk – founded by former Navy Seal Mike Noell – bought the company. Blackhawk was then purchased by ATK in 2010.

ATK Sporting Group in Manhattan produces a variety of products including gun-care products,

targets, holsters, and ammunition packages. These products are manufactured in the Manhattan facility using state-of-the-art injection-molding equipment. ATK has many brands: The Manhattan plant makes parts for big-name brands such as Gunslick, Alliant Powder, RCBS, Champion Target, Blackhawk, and others.

For Kincaid, a Montana State University graduate in mechanical engineering and the design engineering supervisor at the Manhattan plant, being able to get a job in his field and stay in Montana is a bonus.

"I work with a great group of people," Kincaid says.
"They are farm and ranch people and hard workers.
They get to work where they want to live. They
enjoy work and take a lot of pride in their work."

One of ATK's goals is to bring manufacturing back to the U.S, and Kincaid says he is starting to see that happen. In the meantime, the Manhattan operation continues to grow and provide workers with jobs that pay well, he says.



per employee in manufacturing has also been outpacing real GSP growth per employee in other sectors, demonstrating greater efficiency and growing value-added per manufacturing employee.

Many survey respondents indicated that 2013 was as good as or a better year for their firms than 2012. More than 40 percent of firms indicated increased sales and production during 2013, and less than one-quarter of firms reported declines in profits – a marked improvement from 2011 and 2012 when more than 30 percent of firms reported lower profits.

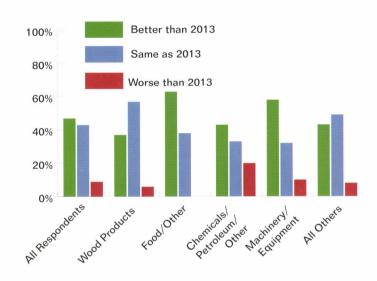
Other signs of ongoing improvements among Montana manufacturers included: 50 percent of those surveyed reported making major capital expenditures in 2013 versus 40 percent in 2012, 27 percent reported new product lines, and 91 percent reported that they did not eliminate any capacity. However, 18 percent of the firms surveyed indicated they temporarily curtailed production during 2013, and 18 percent indicated a shortage of workers during the year.

### **Outlook for 2014**

Forecasters have predicted relatively slow growth in the U.S. economy during 2014. New home starts and existing home sales in the U.S. are expected to increase modestly, and unemployment is expected to decrease somewhat. However, uncertainty lingers in regard to federal policies impacting interest rates, inflation, and health insurance costs. Increased domestic production of oil and gas is expected to help keep energy costs low and boost U.S. manufacturing.

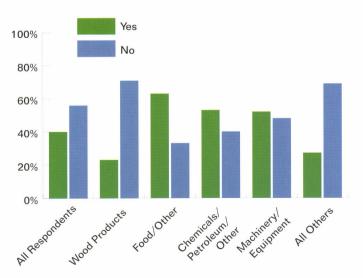
The manufacturers who responded to the BBER's annual survey expressed strong optimism in their outlook for 2014. More than 40 percent expected improved conditions during 2013, and 47 percent expected better conditions for 2014, compared to just 9 percent who expected 2014 to be worse than 2013 (Figure 1). The most optimistic sectors were in the food/beverage and machine/equipment sectors, with 63 and 58 percent respectively, expecting a better year in 2014. The most pessimistic outlook was among the wood products segment, with only 51 percent expecting increased sales, 37 percent increased profits, and 31 percent expecting increased production in 2014.

Figure 1
Overall Outlook for 2014



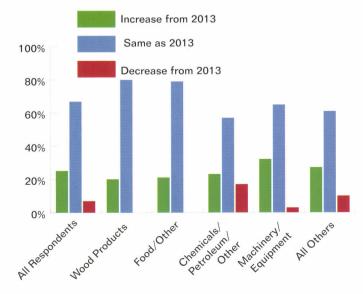
Source: Bureau of Business and Economic Research, University of Montana.

Figure 2
Outlook for Major Capital Expenditures in 2014



Source: Bureau of Business and Economic Research, University of Montana.

Figure 3
Employment Outlook for 2014



Source: Bureau of Business and Economic Research, University of Montana.

The proportion of firms planning major capital expenditures increased slightly between the 2013 and 2014 surveys, with 40 percent of responding firms planning major capital spending in 2014 (Figure 2) compared with 33 percent in 2013. Food/beverage facilities reported the highest rate of planned capital expenditures, with 63 percent planning major capital expenditures, while only 23 percent of wood products manufacturers planned expenditures.

Overall, the 2014 manufacturing outlook for Montana is quite positive, with expectations of higher sales, increased

production levels, and greater profits among most of the state's manufacturing sectors. As shown in Figure 3, many manufacturers are also predicting increased employment in 2014.

Steven W. Hayes is a BBER research forester; Todd A. Morgan is the Bureau's director of forest industry research; Charles E. Keegan III is the BBER's retired director of forest industry research; Colin Sorenson is a BBER research economist; and Shannon Furniss is the Bureau's communications director.

### **Missoula High-Tech Company Creates Greener Economy**

Used coffee grounds, spent brewery grain, algae, and wood chips could be the pathway to a greener economy that is less dependent on foreign oil. That is, with a little help from Missoula's high-tech startup, Blue Marble Biomaterials.

Set near the Missoula airport in a 30,000-square-foot building, Blue Marble scientists are working to replace petroleum-based chemicals in the food, beverage, and personal care markets with natural, sustainable biochemicals. Thousands of consumer products such as chewing gum, skin cream, perfumes, foods, and beverages contain petroleum-based chemicals, and Blue Marble's technology aims to bring traceability and responsibility to quality products and ingredients, according to Chief Science Officer James Stephens.

Blue Marble Biomaterials uses plant material and managed ecosystems of bacteria to produce complex chemical compounds, which are refined using a green chemistry process, Stephens says. The process begins with organic material – coffee grounds, wood chips, and more. Blue Marble scientists then add their trade-secret technology to the mix and produce natural materials to enhance consumer products, from the flavors in chewing gum to the fragrances in perfume.

Blue Marble began seven years ago near Seattle, but the company rapidly outgrew its facility and started to look for a permanent home. The owners landed in Missoula because of the quality of life, an educated workforce, accessible transportation, and a supportive community, Stephens says. Plus, he graduated from the University of Montana with degrees in microbiology and medical technology. Another aspect that appealed to Stephens was the ability to collaborate with universities, businesses, and industries. Blue Marble's partners range from local operations – the university, the Montana Department of Natural Resources, and others – to Fortune 500 companies like Anheuser-Busch.

In a year and a half, Blue Marble has expanded from four employees to 19. They are hoping to speed the company's growth through grants from the Big Sky Trust Fund, the U.S. Small Business Administration, and the Montana Board of Investments. Blue Marble hopes eventually to grow to about 100 employees.

One of Stephens' goals is to keep forming partnerships that advance the company's sustainable technology and offer consumers environmentally-friendly product choices. His timing is right, since a renewable economy has become a priority for consumers, government, and corporations.



## "Tight Oil" Revolution

## A Game Changer for Montana's Economy

by Patrick M. Barkey

n the economic forecasting business we are constantly trying to understand how the forces and trends in the economy will shape the immediate future. So many things that can affect our future are unknowable when forecasts are made, making the prediction business hard enough when trends remain stable. But when events come along that change the trends themselves, economic forecasters truly learn humility.



One of those kinds of events has occurred in the oil and gas industry, and it has made a mockery of projections of the energy future made only 10 years ago. The event, of course, is the discovery, refinement, and large-scale implementation of processes that extract oil and gas deposits directly from the source rock through horizontal drilling and hydraulic fracturing. In industry jargon, this has become known as "tight oil."

In 2005, less than 2 percent of U.S. crude oil was produced this way – in 2013 the share was more than a third, and it continues to grow rapidly. The increases in gas production are no less startling, with unconventional wells now producing about 28 billion cubic feet per day. And for a state like Montana, which sits immediately astride the Bakken/Three Forks formation that has seen so much drilling activity, it has been a sea change for the entire economy.

Of course, forecasters are busy making new projections that take these events into account. That's what forecasters do. But in doing so we are struck by how different the basic trends we use in making our forecasts today are, compared to the ones we used only a few years ago. And how different the world would look today if the revolution in oil and gas production technology had never occurred and the economy had remained on its pre-tight oil trajectory.

So join me as I take you on this thought exercise, to imagine a world – and a Montana – where tight oil didn't happen. This isn't a rigorous analysis – the numbers presented here are mostly back-of-the-envelope stuff. But the story even these rough figures tell is compelling.

### **Changes in the Oil Industry**

Let's start with the oil and gas industry itself. Before the tight oil revolution, the depletion in conventional oil reserves dominated the production statistics for petroleum, particularly for the contiguous 48 states. The year 2005 was one where U.S. production of petroleum and other liquid fuels bottomed out at about 5 million barrels per day (bpd), down by almost half its total in the year 1970. 2005 was also a year in which the U.S. imported 60 percent of its consumption.

Had we remained on that same decline, we might be producing only 4.5 million bpd today. The total is instead 7.4 million bpd, with the difference representing tight oil's surge.

But the increased production is simply the end of the chain. If tight oil had not been developed, its drilling and capital investments would not have happened. That's about 1,100 active drilling rigs and about \$83 billion per year in capital expenditures that go away. Along with that, an

economy with no tight oil would lose the industry jobs, plus the related jobs in transportation, engineering, and even regulation that its development has supported. We conservatively put that at 135,000 jobs paying an average of about \$110,000 per year.

### **Energy Markets With No Tight Oil**

Thanks to the supertankers that prowl the oceans, petroleum markets are global. This is not so for the markets for natural gas. Coming at a time when the energy appetite of developing countries has continued to grow, the increase in U.S. oil production due to tight oil has not pushed down the global price measurably. The same cannot be said for natural gas.

The increases in U.S. natural gas gross withdrawals – from about 23.5 trillion cubic feet (tcf) in 2006 to 30.1 tcf in 2013 – have had an enormous impact on natural gas prices. From prices in the neighborhood of \$12/MMBtu in 2008,

forecasts call for prices in \$4-5/MMBtu range for the next few decades. If tight oil never happened, we'd still be paying those higher prices, and U.S. households on average would have \$800 less to spend on other things in the economy.

Of course, in a world with no tight oil, coal producers would For a state like
Montana, which sits
immediately astride the
Bakken/Three Forks
formation that has seen
so much drilling activity, it
has been a sea change for
the entire economy."

be happier. Low natural gas prices have produced a decline in the reliance on coal for electricity generation that might not have happened without tight oil. And looking ahead, the anticipated revival in U.S. manufacturing competitiveness due to low natural gas prices wouldn't be in anyone's forecast if natural gas prices had remained where they were in 2008.

### **Other Big Picture Impacts**

It's hard to categorize all of the things that might have turned out differently if it weren't for the development of tight oil production. We'd likely be importing more than 60 percent of our oil today – instead of the 40 percent we actually do import. And the gap would be widening instead of narrowing. That would make the balance of payments worse for the United States, which would tend to make the U.S. dollar weaker and imported goods more expensive.

Oil has been a factor in global politics since it was first discovered. We can only imagine how the political power of exporting states like Russia and Venezuela or even Iran would be enhanced in a world where the option of consuming U.S. tight oil production was removed from the table.

Tight oil has even produced some surprises. The substitution of natural gas-fueled combined-cycle power plants for older coal-fired units has reduced CO2 emissions

About 10 percent of all of the new jobs created in the national economy since 2009 are attributable to the growth in the oil and gas industry spurred on by the tight oil revolution."

per kilowatt hour by almost half, in addition to other emissions reductions. That substitution has been spurred on by lower natural gas prices, which are the result of tight oil. The opposite trend has unfolded in Europe.

Without tight oil, we'd probably still be talking about building a natural gas pipeline from northern Alaska to

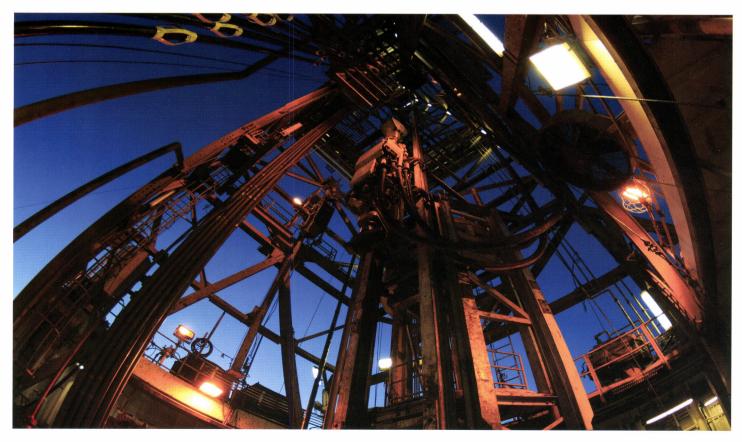
the lower 48. Instead we're reversing the direction of liquified natural gas (LNG) plants once designed to import gas from abroad. And we're talking about piping Alaskan gas to new LNG ports to do the same thing – export our gas abroad.

### **Recovery From Recession**

Almost as remarkable as the size of the spending on shale gas and oil development has been its timing. Just as the worst recession since the Great Depression beset the national economy in 2007, investment in Bakken production and other shale plays around the contiguous 48 states was ramping up. Even with the brief collapse in crude oil prices that occurred in 2008, drilling and production quickly resumed its rapid growth. In places like North Dakota, the construction slump and deep recession that reverberated throughout the global economy simply didn't happen.

Published estimates of the total job impacts of tight oil production – which includes both industry jobs and jobs induced in other industries through spending – are between 600,000 and 800,000 jobs nationally. That means that about 10 percent of all of the new jobs created in the national economy since 2009 are attributable to the growth in the oil and gas industry spurred on by the tight oil revolution.

That timing also helped state governments that benefited from oil and gas activity – including Montana – escape the severe fiscal hardships that beset most other states due to the recession. If tight oil had not happened, it is likely that Montana and North Dakota would not have enjoyed the distinction of being the only two states in the U.S. not to run deficits during those years.



### **Eastern Montana's Economic Challenges**

With story after story about the rapid economic growth in eastern Montana communities like Sidney, Glendive, and Miles City in the wake of the oil and gas boom, it is easy to forget the economic hardship that beset the region in prior decades. Before tight oil really started around 2005, the economies of communities in the region were not on a favorable path.

Between 1990 and 2005, the region lost 9,700 in population, including 6,600 school-aged children. During that same period, the entire 16-county region managed to add just 2,500 net new jobs. By contrast, the remainder of the state added 177,000 new jobs over those same years. On the other side of the state border, the plight of North Dakota's rural western communities was so harsh that the *National Geographic* magazine's January 2008 issue featured it in an article about rural population decline titled "Emptied Prairies," featuring – of all places – a community in Williams County.

Certainly the rapid development of the Bakken oil fields has created issues and challenges for eastern Montana communities. But if tight oil had not happened, those pre-2005 trends might have continued unabated.

### Gateway to the Bakken

Billings, Montana, is not *the* gateway to the Bakken as some of its residents may claim. But it is certainly one of them, and its healthy growth in recent years is testimony to that fact. But if tight oil had never happened, an important spark to its post-recession growth would absent.

Consider that, in contrast to Montana's western cities, the Billings economy is one where: population in-migration continued even in the recession years 2007-09, when counties like Gallatin, Missoula and Flathead saw an abrupt halt to once strong in-migration rates; construction has been booming, thanks to strong heavy construction activity in oil refineries and manufacturing as well as new commercial construction; and, commercial real estate vacancies have remained low.

Without the development of tight oil in general, and in the Bakken in particular, much of the froth in Billings would be missing, and the pace in the economy would not quicken as you drive east on Interstates 90 and 94 – as it certainly does today.

### Conclusion

This article has described a world that doesn't really exist. But if the fracking revolution that changed the entire process of producing crude oil and gas hadn't happened, it might have. Understanding how different things actually are today from where pre-2005 trends were taking us underscores the far-reaching effects of what will undoubtedly be considered one of the most important innovations of the past decade.

Patrick M. Barkey is the director of the Bureau of Business and Economic Research, University of Montana.

Figure 1
U.S. Consumption and Production of Petroleum and Other Liquid Fuels, 1970-2040



Source: Energy Information Administration.



## Early Childhood Education

## **Investment Brings Big Results**

by Jennifer Calder

hat do law enforcement representatives, Republican and Democratic governors, and Nobel Prize-winning economists all have in common? They all support investment in early childhood education. Research on the return on investment in high-quality early childhood education shows short- and long-term savings of between \$4 and \$12 for every dollar invested. Though the evidence is overwhelming, Montana is one of only eight states that does not provide funding for preschool. To understand why investing in high-quality early care and education is a better return on investment than the stock market, we need to uncover what happens in the early years.

### **Brain Architecture**

Advances in neuroimaging technology have allowed us to unlock the mysteries of the brain – how it develops and functions across the life span. In the first few years of life, 700 to 1,000 new neural connections form every second. Because of this rapid development, scientists and researchers from a range of fields look to the first five years as the greatest opportunity for investment.

Pat Levitt, director of the Neuroscience Graduate Program at the University of Southern California, seeks to illuminate the connections among neuroscience, economics, and early childhood. While not intended to reflect precise

measurements, his graph (Figure 1) is a conceptual model that illustrates core developmental concepts. Early experiences affect the architecture of the brain and how it is built by determining which neural circuits are made stronger through use and which are pruned through lack of use. As the brain develops and refines its circuitry, it loses some of its flexibility. The ability to "rewire" or change the brain and behavior decreases over time. Just like building a house, when it comes to brain architecture, it's better to get it right the first time than to try to fix it later.

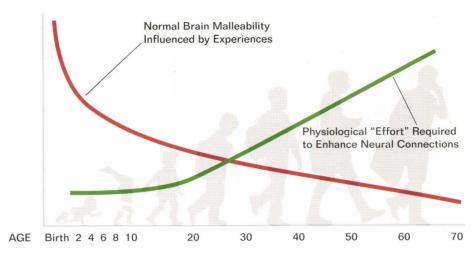
### **How is Brain Architecture Built?**

Think of the back-and-forth volley in a tennis match. One player serves, the other returns. Brain architecture is built this same way. It is the back and forth between adult and child that supports optimal development. A child babbles, a parent responds positively. The child babbles more, and neural connections are built. If adults — parents and caregivers — do not respond to children's vocalizations and gestures in encouraging ways, the child's learning process is incomplete.

### **How Can Development be Disrupted?**

Because a young child's environment is largely one shaped by relationships, healthy development depends on the quality and reliability of the relationships developed with

Figure 1
Core Concepts in the Science of Early Childhood Development
The Ability to Change Brains and Behavior Decreases Over Time



Source: Pat Levitt, National Scientific Council on the Developing Child (2009). Provided courtesy of the Center on the Developing Child at Harvard University, http://developingchild.harvard.edu.

the important people in his or her life. Dr. Edward Tronick, director of the Child Development Unit at the University of Massachusetts Boston, conducts research looking at the importance and impact of relationships in the early years.

Tronick's video "Still Face Experiment" on YouTube shows a mother and child interacting in the serve-and-

return exchange and how unregulated the child becomes when the mother no longer engages. Ongoing disruption of these relationships can harm the child because they literally disrupt the orderly architecture of the developing brain, creating a weaker foundation for future growth. Growing up in environments that have severe ongoing stressors such as poverty, food insecurity, or violence can be detrimental to the developing brain. That severe stress activates the body's alarm system, impairing the development and "wiring" of the brain with lifelong consequences.

Children's social-emotional, cognitive, and physical growth occur in an intertwined, braided manner. If a child is affected by fears or worries, then the child's cognition will be affected. If adults are overwhelmed by stress, they can be less responsive to children's needs. The more severe stress children have in the early years, the more likely they will have problems with learning, behavior, and physical and mental health later on.

### **What Assists with Optimal Development?**

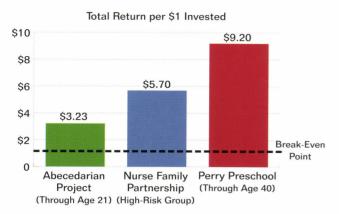
Building the capabilities of the adults in a child's life is proven to be effective in supporting the child's optimal development. When both home and early care and education environments are safe, responsive, language-rich, and support a variety of learning experiences, children thrive. When parents know what to look for in their child's development and what to do to support it, they are better able to meet the needs of their child. Improved parenting skills also enhance employability and economic stability. When child care providers and preschool teachers are highly trained and valued, they stay

in the field longer and are more effective. They are better at developing deep relationships with the children in their care.

### The Future of Early Care and Education in Montana

The Dennis and Phyllis Washington Foundation has long been a supporter of early care and education. In May 2014, they hosted a Business Leader's Summit on Early Childhood Education to encourage investment in high-quality early care and education in Montana. Keynote speaker Paul Tough shared insights he had while working on his best-selling book, "How Children Succeed." Gov. Steve Bullock outlined his plan for voluntary universal pre-kindergarten for all 4-year-olds. If initiated, school districts throughout the state could apply for funding to create or expand high-quality programs that could be housed in the district through Head Start or other private or public programs.

Figure 2
Cost/Benefit Analyses Show Positive Returns
Early Childhood Programs Demonstrate Range of Benefits to Society



Sources: Karoly et al. (2005), Heckman et al. (2009). Provided courtesy of the Center on the Developing Child at Harvard University, http://developingchild.harvard.edu.

## What are the Benefits of High-Quality Early Care and Education?

Nobel Prize-winning economist James J. Heckman is at the forefront of research that aims to quantify just how much high-quality early care and education impacts the economy. Through his analysis of a wide variety of early education programs ranging from the Abecedarian Project to the evidence-based home visiting model Nurse Family Partnership to the high-quality Perry Preschool, he estimates that every \$1 invested in these programs saves from \$3 to \$9 (Figure 2). While all children benefit from high-quality early care and education, children who are at-risk or low-income benefit the most.

### Where do the Savings Come From?

There are immediate short-term savings for employers, communities and states that invest in high-quality early care and education. With 64 percent of children under the age of six in Montana having both or their only parent in the workforce, there is a clear need for high-quality early care and education for working parents' children. Employees with young children in high-quality, stable early care and education programs show improved work performance and less absenteeism and turnover, translating into greater productivity, and fewer training costs for employers.

Further, there are significant long-term savings that lead to a reduction of deficits and a stronger economy. Child graduates of strong early education programs are more likely to be ready for kindergarten, read proficiently in third grade, graduate from high school and attend college, and less likely to need special education or remediation along the way or be held back. In addition, these children are less likely to rely on social services such as public assistance. They are 70 percent less likely to commit violent crimes or be involved in the criminal justice system, which presents enormous savings. Finally, these children are more likely to attend college, making them better prepared with the necessary skills to compete in the increasingly globalized workforce. They are more likely to secure well-paying jobs and buy homes and contribute more to the economy.

The Montana Budget and Policy Center estimates that a universal pre-kindergarten program would pay for itself in nine years and that by 2050, while the cumulative costs of such programs would be \$212 million, the savings would be approximately eight times that at \$1.7 billion.

Jennifer Calder is the outreach coordinator for Montana KIDS COUNT at the Bureau of Business and Economic Research, University of Montana.

### **Early Care and Education Boosts the Economy**

AMERICA'S EDGE is a membership organization of business leaders who work to strengthen businesses and the economy through proven investments in children and youth. In their report, "Strengthening Montana Businesses Through Investments in Early Care and Education," they estimate that for every \$1 invested in early care and education in Montana, an additional 61 cents is generated for a total of \$1.61 in new spending in our state. Such investments would "create an immediate infusion of dollars throughout Montana's local businesses," as programs purchase materials and supplies, expand their spaces or pay rents, and the program staff members spend their income in their communities.

What does this mean in Montana? Heckman estimates that a 5 percent increase in male high school graduation rates in our state would save Montana \$11 million annually in reduced incarceration costs and crime-related expenditures. Further, if this same 5 percent goes on to college, their increased earnings would accrue an additional \$9 million a year. Does graduation matter? It does. Children who attend high-quality early care and education are more likely to graduate from high school. If one year's high school dropouts graduated high school instead, households would have an additional \$800 million in wealth over their lifetimes.

The National Chamber of Commerce and the Institute for a Competitive Workforce have picked up the call as well in their report, "Why Businesses Should Support Early Childhood Education," making a strong case for the benefits of investment in high-quality early care and education.



aughing Grizzly owner, Keegan Eisenstadt, began his business with the desire to generate jobs in a meaningful way for Missoula. He dreamed of developing a locally owned, locally operated, locally financed restaurant that would become a top choice for Missoulians. Keegan understands how much relationships matter, so he approached Bill St. John at Missoula Federal Credit Union. Bill knows Keegan has a history of successful start-ups, and his character and work ethic played a significant role in his decision to help with financing the Laughing Grizzly. Keegan was pleased that Bill was willing to help him meet his needs based on their history and past experience.

If your business is in need of financing, contact one of MFCU's commercial loan officers.



David Rook 523-3528



John Corwin 523-3533



Bill St. John 523-3532



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Cover image from the painting
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by Monte Dolack

